climatic and atmospheric change. It looks at the past (including the events of the Quaternary) and at the present (ozone depletion, the greenhouse effect, etc.). Acid rain has a chapter of its own, as do nuclear issues, energy and natural hazards. The last two chapters are concerned with the human impact on the earth's surface and with environmental management.

The chapter dealing with human impacts on the earth's surface is short and in many ways the least satisfactory. If one takes one of the prime aims of the book as being 'to explore the world's major environmental concerns including the effects on and of human activity' then some of the issues in this chapter deserve more space than they get. Soil erosion, for example, arguably one of the most pernicious and pervasive global problems, and certainly one that is real rather than speculative, gets not much more than a page. Permafrost degradation and pressures on the world's great tundra environment only get a paragraph! In short, the book has a certain imbalance, with the geomorphological components of global change being accorded less attention than they deserve.

Having said that, this book will be used in many undergraduate courses and will provide a generally valuable survey of a very large corpus of material at that vital human/physical interface.

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HILLSLOPE MATERIALS AND PROCESSES (2nd edition) by M. J. Selby, Oxford University Press, 1993. No. of pages: xv + 451. Price £22·50 (hardback £48·00). ISBN 0-19-874183-9.

Eleven years on from its first publication, the second edition of this book is a welcome sight. The text is much changed, and expanded from 11 to 19 chapters and from 264 to 451 pages. The emphasis on supporting illustrative material remains one of the strengths of the new edition, which includes over 250 diagrams and 130 plates. What of the content: what is the same, what has changed and what is new? Some chapters have been expanded and others added, and Selby has broadened the scope of his book, incorporating much recently published material and addressing criticisms by reviewers of the first edition. However, the balance is largely unchanged. Following a brief introduction, six chapters are devoted to material properties, two to weathering and soils, two to water and hillslope hydrology, three to mass wasting, and a final four examine hillslope development models, hazard and risk, magnitude–frequency issues, and rates of denudation.

Notable additions in the materials section include a more detailed examination of bonding between particles (Chapter 2), a consideration of fabric development within soft sediment (Chapter 3), and a revised and expanded discussion of material stress, strain and rheology (Chapter 4). There follow sections which, apart from some re-ordering, are in many places much the same as in the earlier edition, with some elaboration. The discussions of the strength of earth materials (Chapter 5) and weathering processes (Chapters 8 and 9) remain comprehensive, and valuable sources of information. There are exciting new looks at some old subjects. Discontinuity characteristics in rock masses are one case in point, where rather than dwelling solely on important cross-joint parameters, such as surface roughness and continuity, the linkages of cracks to stress–strain patterns and stress field dynamics are considered.

Significant improvements on the first edition include a much more comprehensive examination of soil erosion by water (Chapters 11 and 12). Models and theories of hillslope development (Chapter 16) are more thoroughly addressed. In other places—magnitude and frequency aspects of erosional events (Chapter 18), for example—issues are perhaps still underemphasized. Soil development is now considered (Chapter 9), as are other pedological matters including catenas, palaeosols and relationships between soil properties and environment (Chapter 10). Some chapters present in the first edition have been omitted, resulting in a more balanced text. For example, material on tors and bornhardts is now rolled into Chapter 9. There is also the welcome inclusion of issues such as landslide hazard (Chapter 17), and a more detailed discussion of flow failures on hillslopes (Chapter 14).

What criticism can be levelled at this revised text? The differential length of some chapters, which affects the overall balance of the book, remains noticeable. Sections on the stress, strain and strength of earth materials in 56 pages and mass wasting of soils in 49 pages, sit beside consideration of bonds in little more than four pages and magnitude–frequency issues in nine. Some of the new topics are a welcome sight but, in places, more depth would be useful. The significance of mudrock fabric is a case in point, dealt with in three pages using little text, but many diagrams and scanning electron micrographs. Similarly, the application of finite element methods in rock slope development is considered in a few pages during the discussion of stress, strain and rheology. An expanded exposition would be good to see, perhaps in the context of models of hillslope development rather than material properties. Some of the chapters could be better ordered for a more coherent presentation. Rock slope processes (Chapter 15) would sit better after consideration of rock mass properties (Chapter 6). It would also be sensible to consider the processes and products of weathering before dealing with the physical and geotechnical properties of materials, forming a natural progression to issues such as hillslope hydrology, mass wasting, the factor of safety and stability analysis.

The above issues apart, Michael Selby is to be congratulated on an excellent second edition of his book. It meets its aims in much greater detail than before, is well illustrated (despite one or two pedantic quibbles such as the presentation of Figure 19.6), and is comprehensively referenced with a bibliography extended by over three times and containing in excess of 1000 citations, over 50 per cent of which are post-1980 and a pleasing number of which creep into the 1990s. The text therefore remains an asset, will be a regularly thumbed addition to the bookshelf and, particularly at the soft-cover price, an important addition to the library of any hillslope geomorphologist.

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FRACTALS IN GEOGRAPHY edited by N. Siu-Ngan Lam and L. De Cola, Prentice-Hall, Englewood Cliffs, New Jersey, 1993. No. of pages: ix + 308. ISBN 0-13-105867-3.

Numerous books have been published on fractals during the last decade. None of them directly addresses the uses of fractals in geography, and one of the objectives of this book is to fill this gap. It is intended for physical and human geographers, and researchers involved in cartography and terrain simulation (there is a clear emphasis on physical geography). The book is divided into four parts and a total of 14 chapters. The first four chapters were written by the two co-editors and provide a general introduction to the concepts underlying fractal analysis, measurement techniques and simulation. The second part, consisting of five chapters, is devoted to research and applications in physical geography. The third part comprises three chapters on research and applications in human geography. Finally, the last part includes two articles on applications in mapping sciences.

Overall, the value of the book is somewhat limited by the repetitive information, the lack of consistency and uniformity, and the lack of emphasis on more recent and original applications of fractal ideas in geography. For instance, no detailed reference is made to the extensive work of W. E. H. Culling (apart from a few references in Chapter 5), or to significant recent studies on fluid turbulence (e.g. Sreenivasan, 1991). In the first two chapters, very basic concepts and techniques are described at the most elementary level. These explanations can be found in numerous books and review papers published during the last decade and these two chapters may seem not to be essential. The fourth chapter in the introductory section is, on the other hand, a short but stimulating essay ('A Fractal Paradigm for Geography?'). In addition to discussing an up-to-date list of relevant books on fractals in natural sciences, it represents a valuable attempt to evaluate fractal concepts (scaling, complexity, self-organization at multiple scales) in geography.

Burrough's paper is the first of the second part, on fractals in physical geography. A significant part of the text has been published in a similar format elsewhere by the same author, and information is clearly missing on more recent work. There is, on the other hand, an interesting section linking geostatistical methods and fractal analysis. This is useful and has never been directly emphasized before. Goodchild and Klinkenberg emphasize fractals as null hypotheses for natural forms and channel network topology. This point has been reiterated in a number of papers, such as Goodchild and Mark (1987), one of several recent studies reflecting a renewed interest in drainage network characteristics. This chapter represents a valuable integration of numerous important concepts in fluvial geomorphology. Interestingly, in Chapter 7 Phillips directly addresses scale thresholds and the limitations of fractal analysis in relation to force-resistance relations and process-oriented work. The paper by Plotnick and Prestegaard deals with time-series analysis of bedload transport data. A unique dataset on continuous bedload transport measurements is presented, but relatively little inference is made from the stochastic and potentially fractal properties of the series analysed. There is, again, repetitive information on how to use, for instance, the variogram to determine the Hurst parameter and fractal dimension (repeated in Chapters 2, 5 and 6). This chapter is preceded by one article on multifractal analysis and nonlinear variability. This transition illustrates the lack of uniformity in approach. The chapter on multifractals is long (35 pages) and is conceptually and mathematically beyond all the other papers. No clear introduction on multifractals is presented and the lack of uniformity limits the usefulness of this article. Finally, Chapter 13, on fractal terrain simulation, is worth mentioning here because it successfully incorporates a process-oriented approach with a stochastic modelling procedure. The mixed periodic–fractal model suggested for terrain simulation provides interesting features from a geomorphological perspective. Thus, although suffering some weaknesses of editorial control, this book nevertheless does contain individual papers of interest, and on balance is a useful addition to the earth science literature. It provides the reader with a wide range of applications in geography, and computer programs are presented for fractal measurement and simulation.

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